

LIFE *after* CRP

MAINTAINING
RING-NECKED
PHEASANTS IN
A CHANGING
LANDSCAPE

A GUIDE FOR LANDOWNERS AND WILDLIFE ENTHUSIASTS



Montana Fish,
Wildlife & Parks



NRCS
United States Department of Agriculture
Natural Resources Conservation Service

FSA
FARM SERVICE AGENCY



DUCKS
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LAND AND WILDLIFE IN TRANSITION

Wildlife responds to habitat changes. As land enrolled in the Conservation Reserve Program expires and is converted to other uses, many wildlife species, especially those that rely on grasslands for nesting, brooding, and winter cover, will decline in numbers.

The ring-necked pheasant and other grassland nesting, upland birds are a case in point. The CRP is recognized as a main reason for much improved pheasant populations in Montana and other Great Plains states in the last two decades. Loss of CRP acreage will mean declining pheasant numbers across their entire Montana range.

An expiring CRP contract, however, does not have to mean a void of pheasants and other wildlife on a piece of ground. This special publication is designed to provide private landowners/operators with guidance on ways to manage expired CRP acres for profitability, while maintaining at least some benefits for pheasants and other wildlife.

In addition, practices that preserve or create habitat on expiring CRP acres may also fit into management plans for landowners who don't have CRP acres. Many habitat practice options come with attractive financial incentives from state and federal agencies or private organizations.

While Montana may not in the near future see an annual pheasant harvest approaching 164,000 roosters as it did in 2003, there is still opportunity to provide habitat for these popular upland game birds and associated wildlife.

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Exploring Other CRP Options

Before a producer decides to return CRP land to production, there may be other CRP options worth considering. CRP enrollment is not just limited to the general sign-up periods; certain CRP practices may be offered year-round through what is called "Continuous CRP." These Continuous CRP practices may offer additional incentive payments or higher rental rates than land enrolled through general CRP. Several Continuous CRP practices available in Montana that may be of particular interest are:

- State Acres for Wildlife (SAFE): Montana has three approved SAFE project areas for Pheasants Winter Cover, Sagebrush-Grassland Restoration, and Prairie Pothole Upland Game Bird Habitat Enhancement.

- Missouri-Madison River Conservation Reserve Enhancement Program (CREP): Cropland and marginal pastureland within a mile of the Missouri-Madison River corridor may be eligible for enrollment.
- Pollinator Habitat: Existing stands or new plantings of diverse mixes suitable for pollinator habitat may be eligible for enrollment.
- Highly Erodible Land Initiative (HELI): Land that is highly erodible, having an erodibility index of 20 or greater, may be eligible for enrollment. It may be easier to offer soon-to-expire CRP land under one of these practices, as expiring CRP is automatically considered to meet a requirement that the practice be "needed and feasible."

With more than 430,000 acres coming out of CRP in 2012, and varying amounts in the years to follow, Montana's CRP base may fall to less than 2 million acres by 2015, down from more than nearly 3.5 million acres in 2006-07.

Various management scenarios can provide pheasant habitat on land with an expiring CRP contract, ranging from maintenance of idle grassland, to retaining grass for livestock grazing or haying, or returning it to raising crops.

Managing for maximum habitat without the annual income from a CRP contract is not likely a practical alternative for many landowners, but retaining or creating at least some habitat is an

option that many landowners would consider if it's cost effective and makes sense for an operation.

A good first step is an inventory of expired or expiring CRP acres to determine existing wildlife habitat quality and future land use goals. While this document is oriented to pheasants, it is expected that protection and enhancement of pheasant habitat will benefit to varying degrees other wildlife species such as Hungarian partridge, sharp-tail grouse, and upland grassland nesting waterfowl species. It is important to recognize, however, that pheasants and other wildlife species will respond differently to varying management scenarios.

An ideal landscape for pheasants consists of about 70 percent cropland (approximately 30 percent row crop and 40 percent small grains) and 30 percent hayland or grassland, of which 10-15 percent is undisturbed nesting cover.

This combination of food and cover provides the needed pheasant life requisites. A drinking water source is not a life necessity for pheasants as they get sufficient water intake from dew, frost and food sources.

Greatest pheasant mortality occurs from winter exposure and predation, rather than hunter harvest or dry conditions.

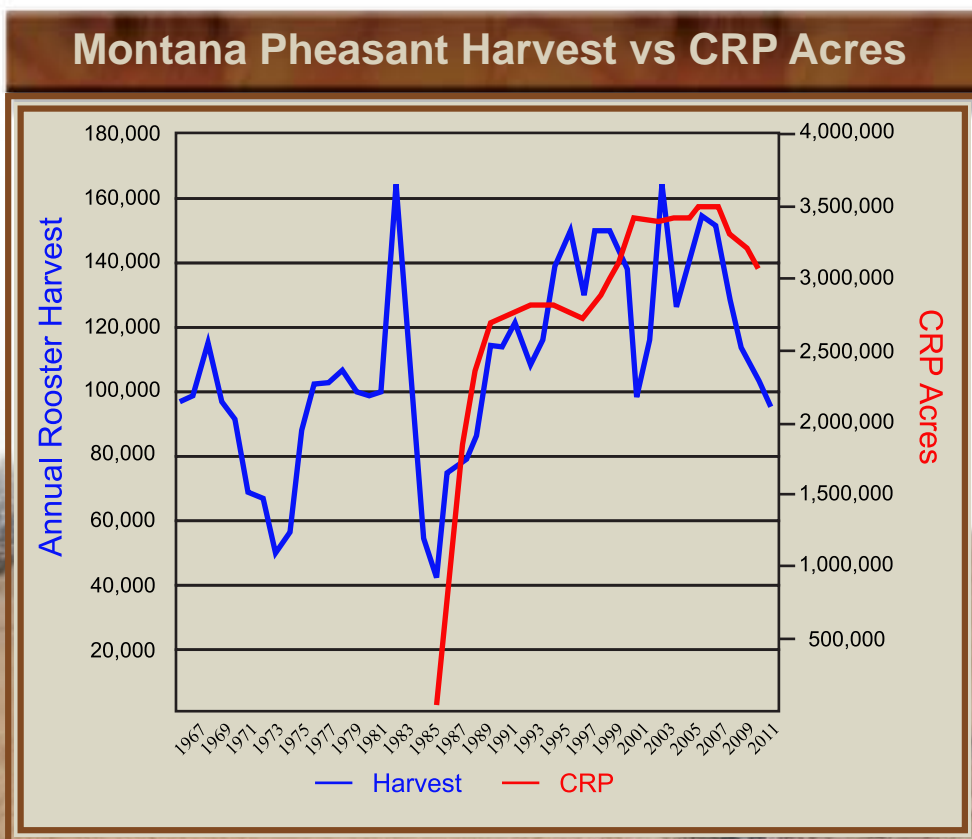


Figure 1. The gains in Montana's pheasant harvest over the past 25 years have been closely tied to CRP acreage but may be set to decline with diminishing CRP acres.

* Data source: MT FWP and USDA-FSA.

PHEASANT HABITAT

FROM SEASON TO SEASON

Throughout the year pheasants use the following cover and food types:



Nesting Cover

Dense herbaceous cover with good overhead concealment from avian predators. Pheasants are six times more likely to nest in undisturbed grassland than in woody areas such as tree rows. Nesting cover should be available in close proximity to brood rearing habitat if possible.

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Brood-rearing Cover

Consists of vegetation with forbs (food sources) that is relatively open near the ground, to allow easy travel by chicks while still providing overhead concealment from avian and other predators. Leafy, succulent forbs attract bugs which make up a major portion of the diet of young birds. Brood rearing cover also happens to be very good habitat for pollinators which is an emerging issue in US agriculture and food production. Other brood rearing habitat may consist of saturated or moist soils in natural depressions free of vegetation.

These may exist within various non-farmed plots that provide for 1/10 acre or smaller polygons offering "bug rich" foraging areas.

If irrigation exists nearby, these polygons can be maintained in a saturated state throughout the 6-8 week brood rearing period.





Food - Waste grains, forbs and grass seeds, fruits and leaves. Adult pheasants also consume insects in spring and summer but depend on traditional sources of food during fall and winter. Plots of cereal grains can be managed to leave strips standing for fall and winter feed.



Rooster Crowing Site

Rooster pheasants select "crowing" sites in the spring to attract females. The availability of numerous edge sites reduces the likelihood of male interaction and territory disputes and hence more females are bred. Mowing or brush hogging suitable crowing sites in late winter that are near to good nesting cover will provide for open areas preferred by crowing roosters in the spring.

Roosting/escape cover

Dense tall shrubs and hedges or dense herbaceous cover, cattail wetlands, weed-grown fence lines and small farmland woodlots. These areas of dense vegetation located near foraging sites are also necessary as escape cover.



Thermal or winter cover

Dense, standing herbaceous and woody vegetation provide thermal and protective cover during winter months. Ideally, thermal cover is within a quarter-mile of food sources to reduce travel distances and exposure to predation when snow cover is deep.

Note that none of these required cover types must include tall trees. Pheasants safely roost in well designed shrub plantings. While trees can provide the thermal cover desired for pheasants, tall trees also provide habitat for avian and mammalian predators that destroy nests, kill adult pheasants, and negatively affect reproduction.

Which of these cover types are close by? Pheasants do not typically travel great distances for their habitat needs, so if any required habitat element is not available within a quarter- to half-mile radius, that's an opportunity for improvement.

Habitat inventories should include soil types. Soil surveys and suitability/productivity interpretations are available for the entire US on the U.S. Department of Agriculture's Natural Resources Conservation Service website at <http://websoilsurvey.nrcs.usda.gov/app/>.

Knowing soils is an important step in the inventory process. For example, soil limitations could mean that woody habitat is not an option. Or, soil limitations could determine future crops and conservation practices necessary to control erosion and retain soil quality achieved while the land was idled in the CRP. Soil information also provides a great opportunity to identify less productive land that may be best retained in upland bird habitat.

A decision on how to use expired CRP land depends on many variables.

LAND USE AND PHEASANT HABITAT QUALITY

Whether future use is for growing crops, livestock grazing, hay production or something else, it's possible to retain or create valuable wildlife habitat without sacrificing productivity.

Unlike some grassland nesting birds, pheasants cannot rely solely on one cover type for their entire life requisites. They use a variety of habitats that are in close proximity and particularly favor the edges between these diverse habitats.

Pheasants need grasslands for nesting habitat. Undisturbed grass is preferable, but they will also use grazed or hayed areas. Grassland proximity to winter cover, such as shrubs and brush or cattails around wetlands and along waterways, is also important. Pheasants can also find food in cropland, particularly during fall and winter.

Undisturbed herbaceous habitat, such as CRP grass, can also provide early or mild winter cover, but often fills in with snow during typical winters.

Expired CRP grasslands can still provide pheasant cover even though they are grazed or hayed. Habitat quality for nesting and brooding cover is determined by grazing and haying management strategies.

While grazed or hayed grassland is more beneficial to pheasants than cropland, landowners with expiring CRP acres may not have use for those options. Well managed cropland can still benefit wildlife without affecting the producer's bottom line

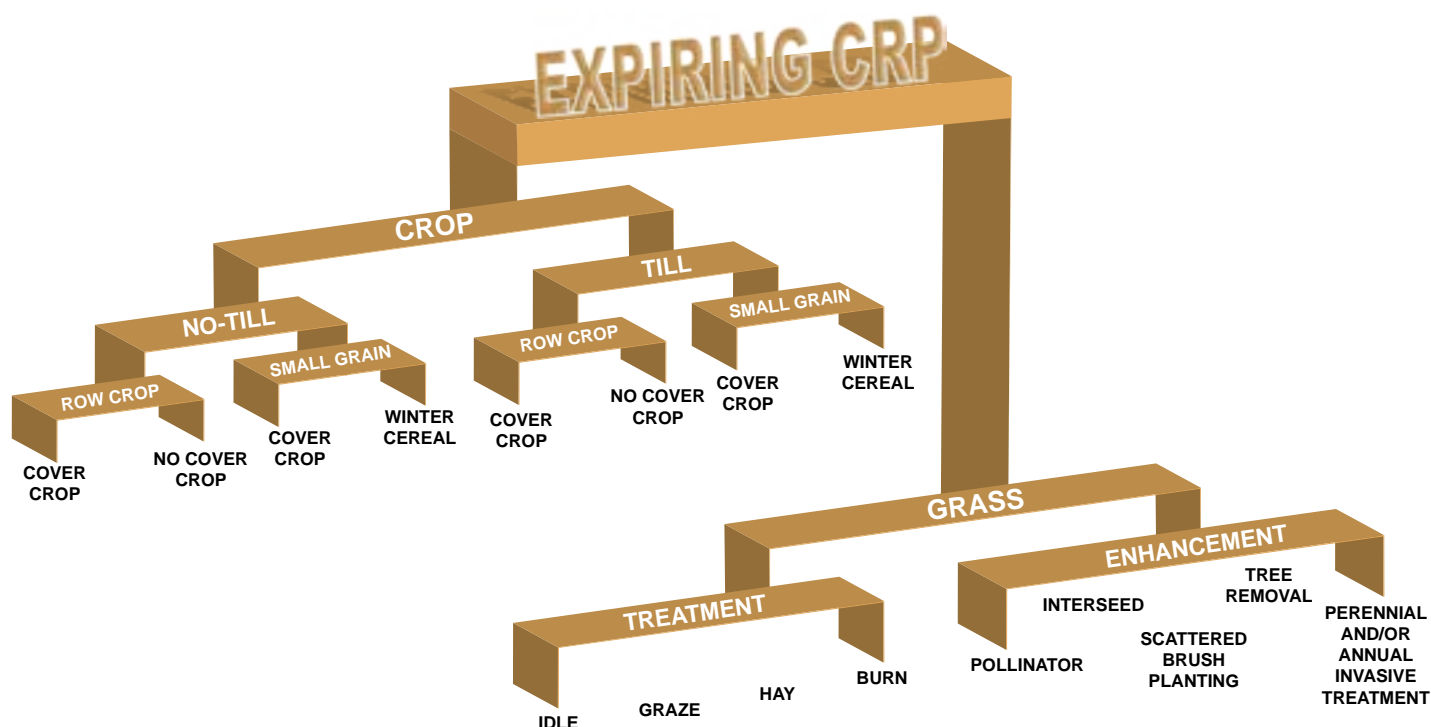
Grassland Ecology

Native or introduced grasslands require management to invigorate and maintain desirable species. Native grasslands evolved with disturbances such as grazing by native bison, pronghorn and elk, and periodic fire.

These frequent disturbances maintained the natural diversity of warm- and cool-season grasses and forbs. Elimination of fire and changes to grazing frequency following European settlement significantly altered the natural disturbance regime of grasslands. This, coupled with introduction of invasive, nonnative species such as Kentucky bluegrass, smooth brome, crested wheatgrass, sweet clover, annual bromes, Russian olive, and the spread of some native woody species (i.e. Rocky Mountain juniper), has, in some cases, dramatically altered the composition and health of native grassland habitats.

Left idle, excessive plant litter accumulates on native and tame grassland. This alters some ecological processes including reducing the amount of sunlight reaching plant crowns near the soil surface. This shading shifts the competitive advantage from native species to shade-tolerant invasives such as Kentucky bluegrass and smooth brome. Unchecked, the invaders take over more and more territory and reduce grass and forb diversity, meaning lower quality habitat for pheasants and ultimately, greatly reduced overall plant and wildlife species diversity.

The management practices described in the following pages can help maintain grass and forb diversity.



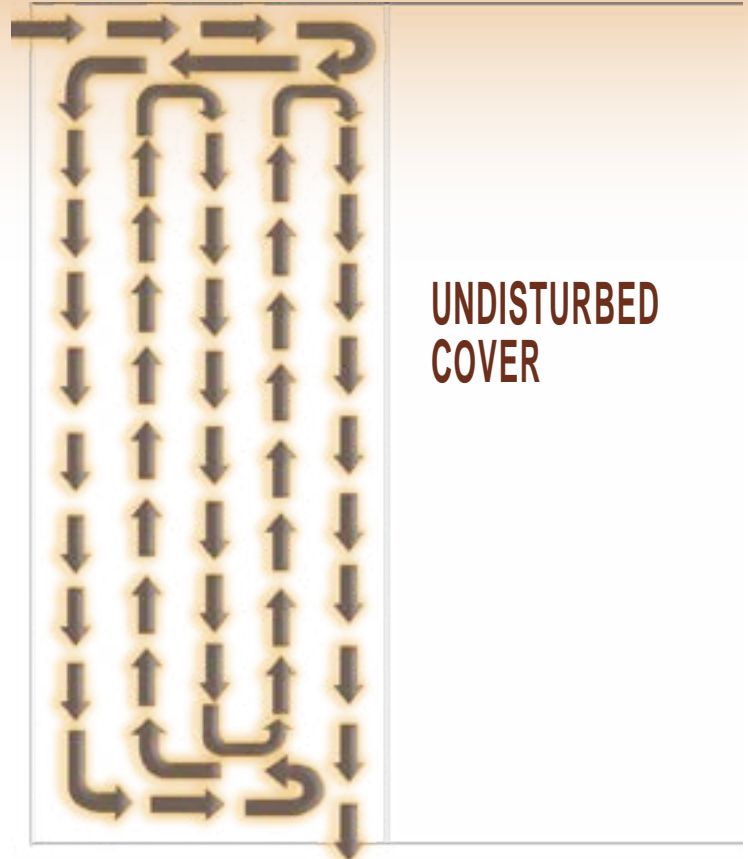
Managing Hayland

Producers can hay one-third of a designated nesting area annually and still provide optimal wildlife nesting opportunity. No matter the amount, delaying haying until August 2 each year yields best results for limiting mortality of pheasant nests and broods, while July 15 is an alternative date if hay quality is a priority.

If better hay quality and quantity is the desired goal, and a producer would like to hay up to 50 percent of dedicated nesting acres annually, following a haying rotation (see accompanying illustration) is a beneficial compromise. In this scenario, 50 percent of the field is cut annually, with each area cut two years in a row, then switching to the other area for two years. This helps ensure good residual cover for nesting most years, while usually increasing hay quality.

Haying toward the idle acres allows pheasant broods and adults to escape to the unhayed area instead of getting trapped in a small strip in the middle of the field. Under this scenario, the producer hays the ends of the field first, then works back and forth toward the unhayed nesting cover.

If haying is used to manage and invigorate a grass stand, rake and remove dead grass (litter) from the soil surface. Using a heavy harrow or other light ground disturbance post-haying will allow more sunlight to reach the soil surface to encourage forb growth.



Haying Diagram

Hay west half on years
1/2, 5/6, 9/10

Hay east half on years
3/4, 7/8

Prescribed Grazing

Grazing systems should match stocking rates to annual growing conditions and control the frequency, intensity, and timing of grazing within each pasture. Grazing systems should allow for adequate recovery between grazing events – 45 to 65 or more days for native grassland, 25 to 35 or more days for introduced grassland depending on growing conditions – to improve plant vigor and provide for residual cover for spring nesting and winter cover for resident wildlife.

Changing deferment periods for each pasture from year-to-year will improve plant vigor and provide undisturbed nesting cover in at least a portion of the grazing management unit. Well-managed grazing systems can provide a diverse, vigorous grass and forb community rich in insect populations to provide a protein source for chicks and fledglings.

Multiple pastures within a grazing system allow the manager to control the amount of time any one pasture is grazed or rested. As the number of pastures within the rotation increases, managers have more options to better meet habitat objectives.



Prescribed Burning

Prescribed burning can help reduce unwanted woody vegetation and invasive plant species. This practice is most productive on native grasses, but also benefits forbs and legumes, such as wildflowers, alfalfa and clovers.

Prescribed burns reduce plant litter, stimulate new plant growth, and increase forage quality in haying/grazing operations. They must be properly planned and timed correctly, however, to effectively reduce target species.

Early season burns (late April and early May) are typically most effective for suppressing Kentucky bluegrass, while late spring burns (late May and early June) are preferable for suppressing smooth brome grass. Effectiveness of summer and fall burns for suppressing these species is still unknown, though some anecdotal evidence appears to support fall burning for Kentucky bluegrass suppression.

Following a burn, monitoring for noxious weeds is necessary. Prescribed burns every 3-5 years is a typical rotation, though annual burning is sometimes necessary to manage native grassland heavily invaded by smooth brome grass or Kentucky bluegrass.

Fencing

Properly constructed and maintained permanent and temporary electric fences are effective in controlling livestock within a well-managed prescribed grazing system. These types of fences are more cost effective, require less maintenance, provide more management flexibility and are less disruptive to wildlife movements than conventional three- or four-barbed wire and woven wire fences.



PHOTO COURTESY OF BILL KLATT

Above and below: Prescribed fire can help improve forage quality in grazing systems, and it can also stimulate beneficial plant growth in undisturbed areas. While there is always a risk that prescribed fire in spring will destroy some nests, pheasants will typically re-nest and long-term benefits will outweigh short-term losses.



PHOTO COURTESY OF BILL KLATT



Trees as Pheasant Habitat

Although pheasants benefit from edge habitat found in agricultural landscapes with grass, cropland, cattail-ringed wetlands, woody cover and weedy patches, they need relatively undisturbed herbaceous areas for nesting cover.

Trees, however, particularly tall growing trees, are sometimes detrimental if developed without a plan. Trees are often added to herbaceous cover with the goal of enhancing habitat, but studies in South Dakota and Colorado have found that pheasant nesting success was lower in and near shelterbelts.

In addition, location of some trees and shrubs could reduce food plot use. Studies in South Dakota indicate pheasants used tree cover only at the end of a severe winter, (a one- in 10- year event) though this use may have prevented total mortality.

In other winters, hen pheasants were much more likely to use cattails, tall grass and food plots for winter cover.

Studies indicate that woody habitat is important for escape cover and good winter cover during severe weather conditions such as we experience frequently in Montana. However, tall growing trees should be limited or not included at all in woody habitat plantings. In addition, narrow tree belts (1-4 rows) can become death traps as they collect drifted snow and can bury and suffocate pheasants looking for thermal cover.

Linear tall tree plantings also provide travel lanes for mammalian predators and perches for avian predators such as crows, magpies and various birds of prey. Scattered shrubs planted around the perimeter of nesting habitat provide escape cover, but don't create travel lanes for ground predators or perch sites for avian predators. These predators can reduce nesting success and increase hen mortality.

If woody habitat is planted, it is best to locate these plantings on the edge of nesting habitat, rather than in the middle, to reduce predator influence.

If other winter cover is not available, wide blocks of low, woody habitat can be planted in compatible soil. These block 'core' habitat plantings should



Pheasants do roost and rest in trees (above), but elevated branches also provide favorable perches for birds of prey such as this red-tailed hawk (left).

These shrub plantings (below) will provide effective winter cover in the future without creating an attractive nuisance for avian predators.



MANAGING CROPLAND WITH



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No-till cropland management can leave behind waste grain that pheasants and other wildlife can use as a food source in fall, winter and even the following spring. Tall stubble can also provide some fall and winter cover until it fills with snow.

be at least 8-10 rows wide, comprised of predominately suckering shrubs. Consider native suckering shrubs that bear fruit for late fall and early winter food sources. If tree species are used, consider evergreens that provide thermal cover; shrubs to catch snow; and designed with the prevailing wind in mind. Rocky Mountain juniper, an evergreen shrub, provides excellent winter cover without attracting as many raptors as do taller trees.

Managing Cropland With Pheasant Habitat in Mind

Pheasants and other wildlife species cannot survive solely in a cropland dominated landscape. Other vital habitat types must be available to meet certain demographic requirements. However, cropland can be important for wildlife and provide many benefits if managed properly. These benefits vary depending on the season, species, type of crop, mechanical disturbances, and availability of food, water and cover. The best management of cropland for wildlife incorporates no-till

practices with high residue crops and diversified cropping rotations.

Pheasants use cropland as a winter food source, and they may find both food and cover during breeding season. Some birds nest in cropland after a crop is planted. When this occurs, exposure to predation and chemical applications is a concern.

Nests and young are vulnerable to mechanical disturbances during nesting and brood-rearing seasons. Winter cereal crops (winter wheat, etc.) are attractive to some nesting birds because of early green-up and fewer disturbances in spring. Mature or taller crops like sunflowers, corn or wheat can provide cover in the summer/fall but do not provide nesting habitat. Planting spring crops in close proximity to nesting cover will maximize benefit to pheasants.

Cropland Management Strategies

The following practices can improve potential wildlife habitat within cropland:

1. Avoid fall tillage. No-till or minimum tillage practices leave weed seeds and waste grain on or near the

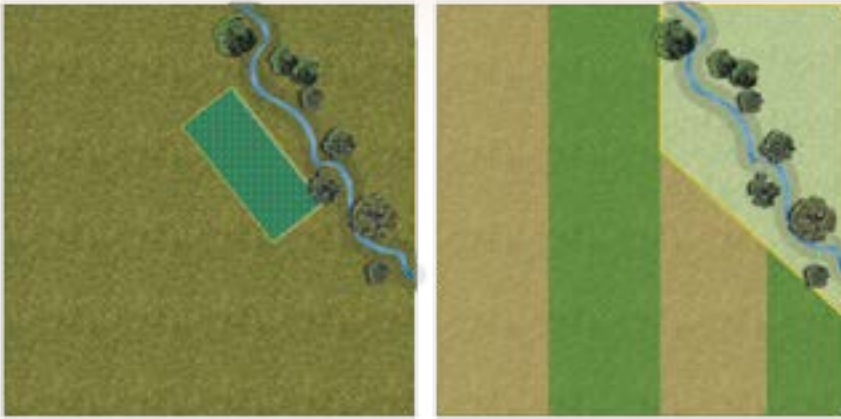
ground that can provide food for wildlife. Avoid mechanical activities and heavy pesticide use in spring. Inversion tillage destroys foods, cover and nests, destroys soil structure and opens fields to erosion.

2. Avoid cropping wetlands and areas directly adjacent to riparian corridors. A grass buffer around wetlands and adjacent to riparian areas provides much needed cover in intensively farmed areas. Cultivation near wetlands promotes surface evaporation, increasing salt concentrations at the surface. Over time, salinity may reduce productivity, eventually making the land unfit for crop production. Buffers can be planted, maintained or allowed to naturally regenerate.

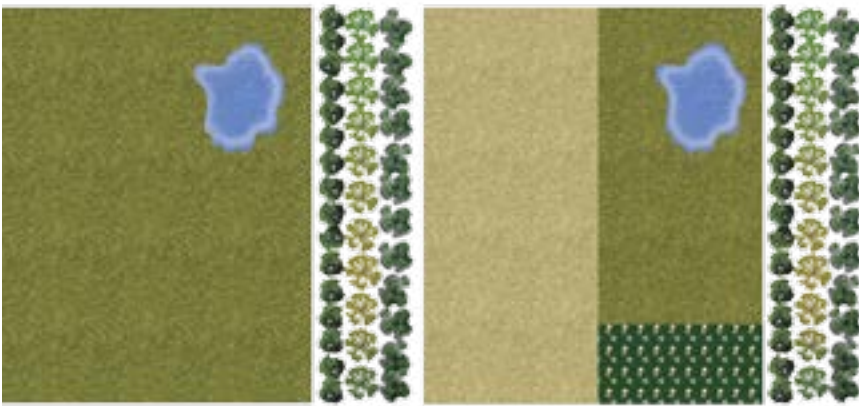
3. Avoid burning cattails in and around wetlands. Cattails are preferred winter habitat for pheasants, providing thermal protection from bitter winds and heavy snow. Cattails within cropland provide ideal winter cover in close proximity to available food (waste grain).

4. Manage saline areas by planting deep-rooted perennial forage species on recharge areas of saline seeps to use excess

PHEASANT HABITAT IN MIND



The diagram on the left (above) depicts a parcel of CRP containing a perennial stream with natural woody cover and a food plot. After the CRP expired the landowner returned a portion of the CRP acres to crop production. In this scenario, grass cover was maintained around the riparian area. The food plot was removed because a portion of the area went into crop production. The green areas in the diagram at right were converted to alfalfa. The crop and alfalfa strips will be rotated every 4–5 years and cover crops are seeded on the cropland after harvest of winter cereals.



The diagram on the left shows a 160-acre parcel of expiring CRP that contains a wetland and is bordered by a multi-row shelterbelt. On the right is that same parcel after the CRP contract expired and the landowner returned a portion of the area to crop production. The landowner re-enrolled the right side of the parcel back into a general CRP contract, and converted an area to high diversity pollinator habitat as an enhancement. The cropland was returned to production using no-till. The area now provides all pheasant habitat requirements throughout the year.

water before it reaches discharge areas. This will also reduce evaporation and prevent salts from reaching the surface. Perennial vegetation manages salinity and provides nesting cover for pheasants.

5. Provide food on conventional crop fields by leaving several rows or strips of standing crops adjacent to permanent winter cover.

6. In landscapes that are intensively farmed, provide nearby nesting and roosting habitat, such as planted cover (CRP and other set-aside grasslands) and wetlands. Include undisturbed or low-disturbance areas in the landscape to balance out more intensively managed areas.

7. Provide properly distributed food plots to prevent unnatural concentrations of wildlife, which may lead to starvation, disease outbreaks or competition with domestic livestock food supplies. Food plots in blocks minimize accumulation of drifting snow, and should be located within one-quarter mile of winter cover, to minimize pheasant exposure to the elements when traveling to and from feeding.

8. Heavy herbicide and insecticide use destroys many valuable wildlife food sources. Excessive or improper pesticide use in crop fields and adjoining areas will not only kill target weeds or insects, but also kill beneficial non-target plants and insects.

9. Proper crop rotations can improve soil health and provide plant and insect diversity. Including winter cereals in a crop rotation system provides pheasants with green cover in which to nest in spring, and provides habitat through harvest. Fall-planted crops also break up field work throughout a farming operation because they mature earlier than spring-planted small grains. Other crops, such as flax, canola and sunflowers, attract insects and can serve as good brood-rearing habitat if insecticide use is limited. Corn and soybeans serve as escape cover during summer and provide a food source during late fall until snow gets too deep.

10. Consider incorporating alfalfa into a cropping system with small grains on a 4–5 year rotation. Delay haying until July 15, or leave an undisturbed block each year to allow for successful nesting. Wildlife-friendly haying operations reduce loss of nesting hens.

11. Recognize that genetically modified crops might reduce wildlife benefits due to fewer weed seeds and insects.

12. Managing crop residues can benefit resident wildlife. Tall stubble can provide food and thermal cover, and depending on snowfall, the benefits could last throughout winter. Combines equipped with stripper headers, which leave stubble height greater than 12–15 inches, provide the most benefit to pheasants while maximizing topsoil moisture retention.



The diagram on the left (above) is an example of 160 acres of CRP prior to expiring. These CRP acres were dominated by smooth brome, providing nesting cover but not much other pheasant habitat. The area contains wetlands and a multi-row tree planting. After the CRP contract expired the landowner decided to return some of the 160 acres to crop production, but still wanted to maintain habitat for pheasants. The diagrams to the right are three examples of returning idled CRP acres to production while still maintaining some pheasant habitat. The wetlands and adjacent uplands were re-enrolled in a continuous CRP practice and brood-rearing (pollinator habitat) was added using a general CRP signup. The far right example provides optimum habitat retention while returning land to crop production. Nesting cover is maintained by retaining a large block of grass; brood cover is enhanced by leafy forb pollinator habitat, and protected wetlands maintain winter cover.

COVER CROPS

Cover crops can provide wildlife food and cover. Taller crops provide obvious escape and thermal cover. Cover crop seed mixes used to improve soil health provide high protein forage for species such as deer and pronghorn. The diversity of plants used in mixes also adds to insect diversity for young birds. Cover crop mixes, which include species in the Brassicaceae family, such as turnip and radish, as well as soybeans, field pea, corn, sunflower, millet and sorghum, will provide quality seed for winter food if left standing to maturity. Canola, an oilseed crop, has been used in western Montana with excellent results providing both cover and winter forage. Areas with irrigation capabilities were the most productive and also provided bare saturated soils for insect production during the brood rearing period. Canola plots should be small in size averaging 1 to 2 acres.

Cover crops, although not a new concept, are gaining popularity throughout much of the upper Great Plains. A true cover crop is planted for soil protection or enrichment between main crops. However, crops planted for a variety of purposes are sometimes called cover crops, regardless of when they were sown.

Known cover crop benefits include retention of soil moisture, building soil structure, preventing soil erosion, reducing chemical inputs, enhancing nutrient cycling, suppressing weeds, creating pollinator and beneficial insect habitat, and as forage for livestock.

As cover crops increase in popularity, the number of plant species incorporated into use has increased substantially. In general, four crop types are associated with cover crops. These four cover-crop types include:



Cover crops can improve soil health and also provide winter food and cover.

1. Cool-season grasses
 - a. Annual
 - b. Biennial/winter annual
2. Warm-season grasses
 - a. Annual
3. Cool-season broadleaf
 - a. Annual
4. Warm-season broadleaf
 - a. Annual
 - b. Leguminous
 - c. Nonleguminous

Cropping systems can be tailored to enhance wildlife needs. A no-till cropping system, which includes high crop diversity from the four major crop types, provides a basic starting foundation. Cover crop combinations can address wildlife resource concerns; a partial list may include vertical structure, pollinators, brood rearing habitat, and food supplies.

Diverse cropping systems include opportunities or windows to seed cover crops. Specifically, after early harvested crops like pea, wheat, triticale and corn silage; or as season-long cover crops.

Cover crop seeding alternatives include:

1. Predominately cool-season annuals seeded in April and May – season long
2. Predominately warm-season annuals seeded in June and July – season long
3. Predominately cool-season annuals seeded after an early harvest
4. Predominately cool season biennials seeded after an early harvest.

Cover crops can provide suitable habitat for pheasants and other grassland nesting birds if they have adequate structure and are relatively undisturbed during nesting. Since pheasant nesting generally starts in late April, a biennial planting of cover crops may best meet hen requirements.

Species to consider include those that generally grow well in the fall and are likely to maintain rigidity and stature throughout a severe winter. Plants that are easily laid over by snow will not

provide the needed structure the following spring.

A cool-season planting that is relatively undisturbed for an entire growing season may provide nesting cover for pheasants, provided it is seeded early enough. While a cool-season mix planted in late April would provide little nesting cover for first nest attempts, it might provide adequate nesting structure later on for hens that lose their first or second nest attempts to predation or abandonment.

Both biennial and season-long cover crops can also provide secure brood cover if proper species are used and they are managed to maintain structure and attract insects. The key is to include multiple species of flowering plants that differ in flower color and timing of flower production.

Again, insects are the primary diet of young chicks and insects are attracted to flowering plants. Insects also provide a valuable source of protein for adult pheasants any time they are available, particularly for hens during nesting.

If fall or early winter food for pheasants is a concern, incorporate small grains into cover crop mixtures regardless of when the crop is planted. Species that produce a lot of seed, and are of higher stature can provide valuable food well into winter, even in times of heavier snow.

While most cover crops do not provide secure winter cover, sorghum-sudan grass does have enough structure and vertical cover to protect wintering pheasants from heavy snow and prolonged cold.

INTERSEEDING

Interseeding the same or different grass species into living, existing grass stands has not proven successful in Montana. Timing of precipitation, soil structure, soil moisture at time of seeding, species selection, seedling vigor, seeding technique, and competition from the established species are all factors that add difficulty and negatively affect the level of seeding success.

In general, interseeding is not recommended in our semi-arid climate. Exceptions may occur on some very sparse crested wheatgrass stands where there is the potential to interseed native forbs or a legume like alfalfa. For practical purposes, though, we recommend using standard or no-till seedbed preparation techniques that result in complete stand replacement and establishment of the desired plant community.

FOOD PLOTS

All pheasants need food. Sometimes, particularly during difficult winters, humans feel the desire to help wildlife out, but this usually does more harm than good. Pheasants can become dependent on artificial food sources, and supplemental feeding congregates birds in a small area, often attracting predators and increasing predation risk. Supplemental feeding can also draw birds away from winter cover, exposing them to the elements and increasing mortality. In light of these concerns, pheasant feeding by Montana FWP is limited to a three-county area in NE Montana – an area that frequently experiences severe winter conditions with continuous deep snow that remains for long period of time due to standing arctic air masses.

Alternatively, planted food plots provide a long-term food source and quality habitat with more natural feeding distribution to reduce the risk of disease transfer and predator concentration.

The most common food plots include annual crops such as wheat, barley, sunflower, and corn, though diverse annual crop mixtures are becoming more popular. These multi-species plantings not only provide a food source, but can provide excellent brood rearing habitat and winter cover.

Food Plot Recommendations

Annual food plots can enhance pheasant survival by providing readily available food and improving the complexity of existing habitat. Food plots are especially important on land planned to provide a winter or early spring food source.

Many areas with quality winter habitat lack a nearby food source. Food plots can reduce mortality from weather and predators when placed in close proximity to dense, winter protection such as shrub plots and emergent wetlands with cattail and bulrush. Food plots can also provide good nutrition for hens prior to egg laying.

The recommended food plot size is one-half acre to five acres. One pheasant needs the equivalent of approximately one bushel of corn over a five-month period. Food plot size should correspond to the estimated population of wintering wildlife.

Consider multiple food plots where adequate winter cover exists.

Locate food adjacent to or within one-quarter mile of winter cover, on the leeward side of protected areas. If that isn't practical, snow traps can reduce the amount of drifting into a food plot.

No-till planting is recommended to minimize erosion.

Planting should take place early enough to ensure plant maturity by fall.

Adequately prepare the seedbed to ensure food plant establishment.

Food plots should be left undisturbed until seedbed preparation the following spring, except for cultivating or spraying to control weeds.

Avoid planting food plots in a location that will increase wildlife activity near livestock feed supplies, newly planted trees or major roads and highways.

Food plots established away from winter cover will expose pheasants to weather elements and predators.

Grain growing next to a shrub row (below) is a typical annual food plot, but perennial plantings that include grasses such as wheatgrass (top-left) to provide escape cover and forbs like Maximilian sunflower (bottom-left) are beneficial in summer because they attract insects that pheasant chicks need during their first few weeks of life.



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PHOTO COURTESY OF USDA-NRCS

ANNUAL FOOD PLOTS		
SEEDING RATES FOR COVER CROP ^(1, 2) SPECIES		
Species	Seeding Rates (lb./ac. PLCS)	
	Dryland	Irrigated
Barley, Spring	45-60	60-75
Buckwheat	40-50	40-50
Camelina	3-5	5-7
Canola spring	5-8	5-8
Chickpea (desi)	80-100	80-100
Chickpea (kabuli)	125-150	125-150
Clover Berseem	8	8
Clover spp	3-6	3-6
Corn ³	10-15,000 (# seeds/ac.)	32-40,000 (# seeds/ac.)
Flax	23-30	35-40
Cowpeas	20-30	30-40
Lentils (Indian Head- 22,000 sds/lb)	40-70	40-70
Millet, Foxtail	4-12	4-12
Millet, Pearl	10-20	10-20
Millet, Proso	15-30	15-30
Oats	50-60	60-70
Peas, Field	70-150	70-150
Radishes, deep-rooted (forage or daikon)	8	10
Safflower	15-30	15-30
Sorghum	5-8	8-10
Sorghum/ Sudangrass crosses	5-8	8-10
Soybeans	25-40	35-45
Sudangrass	25-30	25-30
Sunflower ³	14-21,000 (# seeds/ac.)	20-25,000 (# seeds/ac.)
Sweetclover	4	3-6
Teff	4-5	5-6
Triticale, Spring	50-60	60-70
Triticale, Winter	45-55	55-65
Turnips	8	8
Vetch, Chickling	60	60
Vetch, Hairy	25-30	25-30
Wheat, Spring	50-60	60-80
Wheat, Winter	40-60	50-70

¹ Cover crop species can have a wide range of seeding dates ranging from spring to fall depending on specific use and climatic conditions. Generally soil moisture must be apparent within the top two inches of soil to ensure planting success. This is not a complete list; consult the NRCS about other species.

² Seeding rates are for a single species planted for maximum crop production; adjust rates for mixtures based on desired percent composition of species.

³ Seed size can vary widely; consider planting by number of seeds per square feet or acre to ensure adequate stands. Recommended seed rates for corn, sugar beet and sunflower are based on seeds per square foot.

Perennial Food Plots

Perennial food plots – those that do not require planting every year – provide added dividends for birds, especially those species whose chicks depend on insects for food, like pheasant and sharp-tailed grouse.

Perennial food plots comprised of flowering forbs attract insects and provide food for chicks. These forbs also attract pollinating insects such as bees, which benefit plant reproduction.

Perennial food plots can vary in size and location throughout nesting habitat to provide adequate feeding sites for chicks. Choose sites that are relatively free of noxious and invasive weeds and that have suitable soils.

Timely weed control prior to and during establishment is required. Maintain sites with weed problems weed-free for at least two years prior to planting. A diverse mixture of native grasses and forbs is recommended, with no more than 25 percent grasses by seed count. A suggested perennial food plot seed mix is listed below.

Use alternate drill row or cross-hatch grass rows with forbs to increase success of forbs in the planting.

PERENNIAL FOOD PLOT MIX				
GRASSES				
Species	Variety	% in Mix	# PLS for full seeding ¹	# PLS lb./ac. in mix ¹
Tall Wheatgrass	Jose or Alkar	10	10.0	1.0
Basin Wildrye	Trailhead or Magnar	10	6.0	.6
Canada Wildrye	Mandan	5	7.0	.35
Subtotal		25		1.95
FORBS				
Indian Blanket Flower	common	10	7.0	0.7
Blue (Lewis) Flax	Appar	10	3.0	0.3
Yellow Coneflower	Stillwater	10	2.0	0.2
Purple Prairie Clover	Bismark or Northern	10	3.0	0.3
Maximilian Sunflower	Medicine Creek	20	1.0	0.2
Small Burnet	Delar	15	20.0	3.0
Subtotal		75		4.7
Total		100		6.65

¹ Drilled seeding rate. Double PLS rate if broadcast.

Perennial oilseed sunflowers are a great addition to any food plot mix as they provide high energy food and resist lodging under most conditions including heavy snow.



MONITORING & EVALUATION

Now that you have enhanced pheasant habitat – monitor the results!! Two surveys that land owners can use to monitor population trends and predict upcoming harvest potential are Spring Call Counts and Late Summer Brood Counts. These surveys should be conducted annually to establish long term data and estimate population trends. These activities also provide excellent opportunities to involve neighbors, clubs, and youth in a fun, outdoor experience which provides information to guide future habitat management. Another monitoring method, Harvest Surveys, can be used to estimate the percentage of adult males and juvenile males in the population.

Spring Call Counts

Roosters select “crowing” sites to attract females every spring. These sites vary in habitat type, yet they typically have some escape cover nearby. If two males encounter each other near established crowing sites, a confrontation usually ensues. Roosters will crow throughout the day but early dawn and dusk appear to be the peak crowing periods. Research suggests that roosters are not likely to crow more often than once every 2 minutes. A count of crowing males can provide an estimate of male population size and reveal whether or not your property has a sufficient number of males to breed available females.

Methods

Select several routes, traveled by either vehicle or walking depending upon your property size, that represent a sample of the habitat types present. For example, on a Western Montana property of 1,200 acres consisting of riparian bottom, pasture, and agricultural fields, one survey route was established along service roads. The survey was conducted in mid-April to early May. Four selected points were located along the route. The points were far enough apart as to not hear duplicate calls. All roosters heard within a two-minute interval at each point were recorded. General location of the rooster was plotted on a map as well. The survey was repeated on three consecutive days just prior to sunrise and again at sunset. The average number of calls was tallied at the conclusion of the survey. The information provided managers with an idea of how many roosters the property holds. The results will reveal growth or declines in male pheasant numbers over time which may influence future management decisions.

Pheasants Forever volunteers look over an annual food plot to judge its progress.



Late Summer Brood Counts

Annual Late Summer Brood Count surveys are another tool that can give managers valuable information. Brood counts provide an indication of first nesting success as well as for subsequent nesting attempts, which usually occur if the first nest was destroyed. Healthy brood numbers indicate adequate nesting cover and healthy brood habitat. Good brood habitat typically consists of areas with moist, bare soils or stands of diverse grasses and succulent, broad-leaved forbs, both of which are rich in soft-bodied insects. Brood surveys finding seven to nine chicks per adult indicate a healthy, expanding population. Numbers in the three to six chicks per adult range reveal that brood habitat may be limiting which may increase predation of chicks. Brood surveys below three chicks per hen indicate poor recruitment which may warrant changes in management practices. As with Call Counts, it is important to collect brood survey data every year to develop indicators of population trends over time.

Another brood count technique uses a “survey party”, much like a hunting party, to work prime, pheasant habitat. Flushing dogs may be used to flush birds for this survey. Work a field as if you were hunting, beginning at one end and “pushing” a field. You may also place spotters at the end of the field to record flushed birds. Upon completion of the field, summarize the observations into adult hens and juveniles. As with the road observation technique, attempt to flush and record at least five broods to get an accurate estimate.

Fall Harvest Surveys

This survey should be carried out each year by all hunters on a property to serve as a good indicator of annual production. If the fall harvest consists of many young birds, indications are that the property had good production. Conversely, if the majority of harvested birds are adult roosters, the results may suggest poor production.

Methods

Brood surveys are typically conducted in each year in August when chicks are around six to eight weeks old. They can be conducted throughout the day but early morning surveys often reveal the highest numbers. There are two common techniques for conducting brood surveys on a property. One involves driving service roads early in the morning when the birds are attempting to dry out from the overnight dew and are visible. Use binoculars or a spotting scope to count all adult hens and young. It may require five to ten minutes of undisturbed observation to get an accurate count. Once the birds are recorded, proceed to their location and attempt to flush the birds. Adult hens will appear larger with a sharp pointed tail; young pheasants will be partridge-size with a rounded tail. Typically the flush will reveal additional birds. Survey at least five, individual broods to provide an average recruitment number for the year.

Methods

This technique involves recording the annual fall harvest of male pheasants by age class; determining percent adult vs. juvenile. In the early part of the season it is fairly easy to distinguish juveniles from adults based on the presence of immature plumage. Later in the season, use spur length as well as the presence of juvenile feathers on the tail and wing.

Volunteers conduct late summer brood count to determine success of upland game bird habitat projects on Freezeout Lake Wildlife Management Area.



CONSIDERATIONS FOR OTHER

Montana is fortunate to have many species of game birds that utilize CRP fields. As mentioned earlier, most practices that benefit pheasants provide some level of benefit for many ground nesting birds and other grasslands wildlife. Following are a few important, species-specific considerations for expiring CRP owners.

Greater Sage Grouse

Our largest grouse is a key native species that occupied Montana's vast grasslands prior to settlement. The Greater sage grouse can benefit greatly from these post-CRP considerations, where appropriate:

- Intact grasslands benefit sage grouse. Keeping expired CRP in grass rather than cropping avoids fragmentation of the landscape. A good grazing management system can maintain seasonal habitat requirements for sage grouse



PHOTO COURTESY OF BRUCE WAAGE, USDA-NRCS

Male sage grouse on courting grounds in Central Montana.



PHOTO COURTESY OF CRAIG ROBERTS

while providing quality livestock forage.

- Diversity is good for livestock and sage grouse. Practices such as prescribed grazing can increase forbs and legumes that are essential to successful sage grouse broods.

- Plan for wildlife friendly infrastructure elements. Include escape ramps in water tanks and consider fencing location and collision deterrent features prior to building.

Sharp-tailed grouse

Another of our native 'pheasants', sharp-tail populations benefited a great deal from CRP located near their bunchgrass-shrubland preferred habitat. Post-CRP con-

A sharptail works the grassland/cropland edge during winter. Shrubs can help provide a food source as well as protective cover.

CRP ASSOCIATED WILDLIFE

siderations for sharp-tail grouse are:

- Plant and maintain mixed, native grasslands (grasses and forbs) using a prescribed grazing plan to enhance bunch-grass pastures.
- Grain and stubble fields adjacent to shrublands and tree-filled drainages

family. Huns frequent the edges between grasslands and cropland. As a result, Huns are best served by practices that:

- Maintain a diverse landscape of short and tall grass, brush, and forbs (annual weeds) interspersed with small grains and stubble fields.

using post-CRP fields include:

- Implement grazing systems that maintain a range of residual residue to offer a range of nesting sites and to deter predators.
- Remove tall woody vegetation (tall shrubs and trees) encroaching in open



PHOTO COURTESY OF CRAIG ROBERTS

A Hungarian partridge forages along the edge of a grain field following a snowfall.

benefit sharp-tailed grouse. Shrub plantings adjacent to CRP grasslands or converted croplands can serve this habitat requirement.

Hungarian (Gray) partridge

Another of our introduced game birds occurring throughout Montana, the Hungarian or Gray Partridge, most often called the 'Hun', is also in the pheasant

- Provide field border food plots or standing 'waste' grain along low shrubs, grassy draws, or other areas with good escape cover.

Upland Nesting Ducks

Many species of ducks nest in uplands or grasslands away from wetlands prior to rearing their young in wetlands. Considerations to improve nesting success of ducks

grasslands as trees attract predators (raccoons, magpies, ravens and raptors) known to reduce overall nesting success.

- Restore and protect wetlands that are embedded in CRP fields. Wetlands provide much needed food, water, and cover for many upland wildlife species in addition to brood rearing areas for waterfowl. Cattails and bulrush also provide critical winter cover habitat.



For Further Assistance

CRP has been on the landscape since 1986. Wildlife, including ring-neck pheasants and other upland game birds, responded and achieved populations not seen since the Soil Bank days of the 1950s and 1960s.

Montana's pheasant populations of the 1990s and 2000s became new historic highs. Although the guidelines outlined in this document may not provide habitat equivalent to what we experienced with CRP, they do provide options for landowners to enhance or retain some available habitat while maintaining income potential on lands where CRP contracts have expired.

Landowners concerned with pheasant and other wildlife populations should inventory their own and surrounding lands, and utilize a variety of available tools to fulfill annual wildlife needs and maintain local pheasant populations.

Information and assistance on inventory, planning, and implementing wildlife habitat projects is available by contacting your local NRCS office, Pheasant Forever biologist or Montana Fish, Wildlife & Parks biologist using the contact information provided below.

Credits & Contributors

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